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REPORT

Chlorophyllin and Cancer Prevention

Preventing cancer is a lot easier than trying to stop it once it occurs. Research shows that there are several different ways of preventing the disease, which occurs in stages that take years to unfold. The first stage involves damage to DNA. Cancer cells are essentially the body's own cells. However, they contain a corrupted version of normal DNA. DNA damage is caused by a loss of methylation patterns, and from attacks on the structure itself. Corrupted DNA gets replicated over and over as new cells are made. That's why it is critically important to prevent the damage from occurring in the first place.

The human body is constantly bombarded with damaging free radicals, not only from the environment, but from the body itself. The immune system, for example, creates free radicals to help kill pathogens. Mechanisms have evolved to counteract the damage and protect DNA. Antioxidants are the main defense. They're found both in food, and the body makes its own.

Because they protect DNA, antioxidants are an important defense against cancer. They block free radicals that can damage DNA. The degree to which they are able to neutralize free radicals can be detected in a laboratory, and many compounds have been tested for their ability to stop various types of free radicals. However, not all antioxidants are good at stopping all types of free radicals.

An anti-cancer supplement with power

One of the most potent antioxidants that has been discovered is a form of chlorophyll known as chlorophyllin. Chlorophyllin is a semi-synthetic form of the natural chlorophyll that makes plants green. It has better effects than chlorophyll, and has been extensively tested for many years. Chlorophyllin, it turns out, is very good at blocking two types of free radicals that occur in food: heterocyclic amines and aflatoxin. Aflatoxin is a toxin from a fungus that grows on grains such as corn and rice. It is highly carcinogenic, and causes liver cancer. It cannot be seen on food, but if present, can harm a person without them knowing it.

Heterocyclic amines are chemicals created when food is cooked, particularly at high temperature. According to the Cooked Food Mutagen Reference List and a report in Food Chemistry and Toxicology, food exposes the human body to as many carcinogens as cigarette smoke. Grilled meat, fried potatoes, broiled fish-these foods contain heterocyclic amines. Ironcially, when the body metabolizes these by-products in an attempt to get rid of them, it converts them into carcinogens.

One way heterocyclic amines and aflatoxin cause cancer is by generating DNA-damaging free radicals. Vitamin C is an antioxidant most people are familiar with. And while it's very good for many things, vitamin C doesn't have what it takes to stop this kind of damage. Chlorophyllin and I3C (a phytochemical from cruciferous vegetables) have been proven the most powerful against aflatoxin and heterocyclic amines. It appears that they work in different ways, and may also work in a complimentary way. They are very powerful-more powerful, even, than the body's own antioxidant, glutathione.
Chlorophyllin also goes after free radicals generated by other things such as x-rays and sunlight. It reduced a type of DNA damage from x-rays 90% in one study. This is remarkable protection. Chemotherapeutic drugs are another source of free radicals. Free radicals from chemotherapy damage healthy tissue; sometimes a chemo drug cannot be used because of this side effect. In a study on cyclophosphamide, chlorophyllin significantly reduced bone marrow damage without interfering with the drug's anticancer effect.

Neutralizes carcinogens

But that's not all chlorophyllin can do. Studies show that in addition to being a powerful antioxidant, chlorophyllin can actually latch onto carcinogens such as heterocyclic amines and prevent them from binding to DNA. For this reason, it has been called an "interceptor molecule". When chemicals attach themselves to DNA, it causes an "adduct". Adducts prevent DNA from being

replicated normally when cells divide. It's important to prevent this type of damage so that DNA will replicate normally and not create the potential for cancer. Chlorophyllin is able to intercept cancer-causing agents because of its unique chemical structure.

It's one thing to know chlorophyllin has anti-cancer effects at the molecular level; it's another to know that these effects will translate into something visible. Will an "excess of chlorophyllin in the diet" prevent cancer, as researchers at the New York Medical College predict it will?

Liver cancer

The highest rate of aflatoxin-induced liver cancer in the world occurs in the Qidong province in China. If chlorophyllin's benefits are going to show up, they'll show up here. Researchers from the Johns Hopkins School of Public Health are in the process of doing a study to see if chlorphyllin supplements will make a difference. So far they have determined that if chlorophyllin is taken three times a day with meals, it reduces aflatoxin carcinogens in the body by 55%. They estimate that this simple, cost-effective approach will delay the development of liver cancer in Qidong province by 20 years. That's 20 years on top of the approximate 20 years it takes for the cancer to develop in the first place. (This "pushing back" of cancer's appearance for two decades could save the U.S. millions of lives, and billions of dollars in healthcare costs.)

The Johns Hopkins study relates to aflatoxin, but chlorophyllin prevents liver cancer caused by other things as well. It has been proven in rodents that chlorophyllin also prevents liver cancer caused by a nitrosamine found in beer and hard liquor. Nitrosamines are extremely potent carcinogens that also turn up in "lunch meat," hotdogs and the like.

Other cancers

Another cancer that has been studied in conjunction with chlorophyllin is colon cancer. Both chlorophyllin and I3C are powerful at stopping this type of cancer in the early stages. Research shows that chlorophyllin inhibits a precancerous condition known as "aberrant crypt foci" by about 90% in rats treated with the most prevalent heterocyclic amine in fried beef (i.e., hamburgers). I3C was 100% effective in the same study. Both work by keeping the heterocyclic amine from being metabolized. Stopping the metabolism of dangerous chemicals so that they don't become carcinogenic is another way that chlorophyllin works against cancer- in addition to stopping free radicals and intercepting toxins.

Chlorophyllin has been tested in human breast cancer cells. Researchers at the University of Kentucky tested eight cancer-preventive agents, including chlorophyllin, against chemically-induced DNA adducts. Chlorophyllin was one of the top three DNA defenders, inhibiting adducts by greater than 65%. Genistein and ellagic acid came in second at greater than 45% inhibition.

The effective dose of chlorophyllin needed to protect DNA is low, making it the most potent DNA protection available in such a small package. According to the studies done so far, a person should take 2 to 4 mg per kilogram of body weight. (Note: a kilogram is 2.2 pounds).

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